

THIN FILM RESISTOR STRUCTURE AND METHOD FOR FORMING THIN  
FILM RESISTOR STRUCTURE

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ABSTRACT OF THE DISCLOSURE

The present invention relates to a method for forming a thin film resistor and a thin film resistor formed over a semiconductor substrate. A gate structure is formed and a dielectric layer is formed over the gate structure. A via is then etched that extends through the dielectric layer so as to expose a portion of the gate structure. A layer of titanium nitride is deposited using a chemical vapor deposition process. A rapid thermal anneal is performed in an oxygen ambient. The rapid thermal anneal incorporates oxygen into the titanium nitride, forming titanium oxynitride film. A layer of dielectric material is then deposited and etched-back to form a dielectric plug that fills the remaining portion of the via. The titanium oxynitride film is patterned to form a titanium oxynitride structure that is electrically coupled to the gate structure. A metal layer is deposited and patterned to form an interconnect structure that electrically couples the titanium oxynitride structure to other circuitry.